

PATENT ABSTRACTS OF JAPAN

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(71)Applicant : MATSUSHITA ELECTRIC IND CO
LTD

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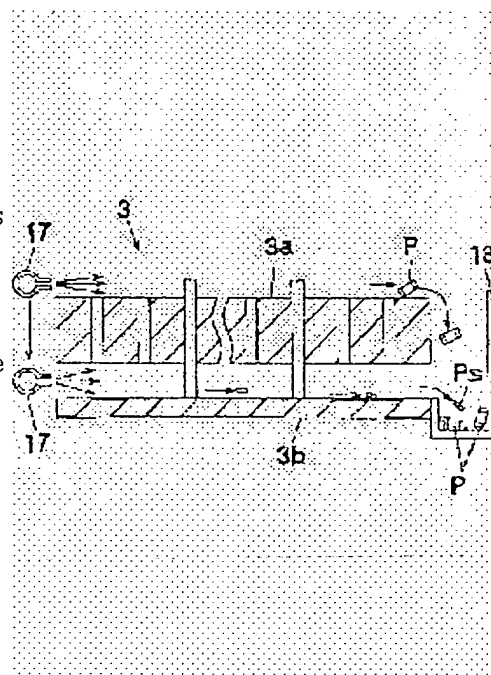
(72)Inventor : NAGAO KAZUhide
KASHIWAGI YASUHIRO

(54) ELECTRONIC PARTS MOUNTER

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an electronic parts mouter which can easily remove the fallen foreign matter at a board positioning part, and can prevent nonconformity.

SOLUTION: In an electronic parts mouter which mounts an electronic part on a board by means of a mounting head, the board position positioning part 3 to position the board is equipped with an under receiving jig 3a which receives the board at the time of mounting of electronic parts from under by means of a board-under-receiving pin, an air nozzle 17 which blows away the foreign matters such as small parts Ps remaining in the gap to the top of this under receiving jig 3a or a base member 3b, by air blow, and a recovery container 18 which accommodates and recovers the blown-away foreign matter. Hereby, this mouter can prevent the nonconformity caused by foreign matter without performing the foreign matter removal work by hand.



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CLAIMS

[Claim(s)]

[Claim 1] the upper part of the bottom receptacle fixture which receives a substrate the bottom in the substrate positioning section which is electronic-parts mounting equipment which electronic parts are taken up by the loading head from the feed zone of electronic parts, and is mounted in a substrate, and positions said substrate, and makes it it by the bottom receptacle pin of a substrate at the time of electronic-parts mounting, and a bottom [this] receptacle fixture -- and -- or the electronic-parts mounting equipment characterized by to have a tailing means remove the foreign matter which remains in the lower part.

[Claim 2] said tailing means -- the upper part of said bottom receptacle fixture -- and -- or the electronic-parts mounting equipment according to claim 1 characterized by being the container for recycling which contains and collects the foreign matters blown away by the air injection means and air which inject air in the lower part.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the equipment for electronic-parts mounting which mounts electronic parts in a substrate.

[0002]

[Description of the Prior Art] There is the so-called double-sided mounting substrate with which electronic parts are mounted not only in one side of a substrate but in both sides among the substrates in which electronic parts are mounted. At the mounting process of this double-sided mounting substrate, after mounting to the 1st page is performed first, a substrate is reversed and mounting to the 2nd page is performed. In the case of this mounting to the 2nd page, since the existing component side in which the 1st page, i.e., electronic parts, was mounted serves as facing down, in case a substrate is positioned and held to a mounting position, electronic parts cannot serve as a failure and cannot carry out field support of the existing component side directly. For this reason, a bottom receptacle possible part other than the electronic-parts mounting part of an existing component side is selected suitably, and the approach of supporting this location by the bottom receptacle pin is used. By this approach, the bottom receptacle fixture with which many pin wearing holes for equipping with a bottom receptacle pin were prepared is prepared in the substrate positioning section.

[0003]

[Problem(s) to be Solved by the Invention] By the way, in the substrate positioning section in which mounting of electronic parts is performed, it is easy to deposit foreign matters, such as electronic parts which fell accidentally from the transfer head at the time of mounting actuation, and small components. Since such a foreign matter causes abnormalities of operation and device breakage, it is necessary to remove it periodically. However, when the bottom receptacle fixture which supports a substrate by the above bottom receptacle pins is prepared, the structure of the substrate positioning section becomes complicated and the foreign matter which once fell and entered the interior of a device is hard to be discharged. And it had the trouble of being easy to generate faults, such as abnormalities of operation resulting from a residual foreign matter, while removal of the foreign matter by the help is difficult a part and removal took time amount and time and effort to it, since this part was narrow.

[0004] Then, this invention can remove easily the fall foreign matter in the substrate positioning section, and aims at offering the electronic-parts mounting equipment which can prevent fault.

[0005]

[Means for Solving the Problem] the upper part of the bottom receptacle fixture which receives a substrate in the substrate positioning section which electronic-parts mounting equipment according to claim 1 is electronic-parts mounting equipment which electronic parts are taken up by the loading head from the feed zone of electronic parts, and is mounted in a substrate, and positions said substrate the bottom, and makes it it by the bottom receptacle pin of a substrate at the time of electronic-parts mounting, and a bottom [this] receptacle fixture -- and -- or it had a tailing means remove the foreign matter which remains in the lower part.

[0006] electronic-parts mounting equipment according to claim 2 -- electronic-parts mounting equipment

according to claim 1 -- it is -- said tailing means -- the upper part of said bottom receptacle fixture -- and -- or it is the container for recycling which contains and collects the foreign matters blown away by the air injection means and air which inject air in the lower part.

[0007] the upper part of the bottom receptacle fixture which according to this invention receives a substrate the bottom and carries out it by the bottom receptacle pin at the time of electronic-parts mounting -- and -- or the fault by the foreign matter can be prevented by having a tailing means to remove the foreign matter which remains in the lower part, without doing a manual tailing activity.

[0008]

[Embodiment of the Invention] Next, the gestalt of operation of this invention is explained with reference to a drawing. Drawing 1 is [the fragmentary sectional view of the substrate positioning section of this electronic-parts mounting equipment, drawing 4 , and drawing 5 of the perspective view of the electronic-parts mounting equipment of the gestalt of 1 operation of this invention, drawing 2 , and drawing 3] the fragmentary sectional views of the bottom receptacle fixture of this electronic-parts mounting equipment.

[0009] With reference to drawing 1 , electronic-parts mounting equipment is explained first. In drawing 1 , the conveyance way 2 is arranged in the center section of the pedestal 1 in the direction of X. The conveyance way 2 conveys the substrate which is not illustrated and positions it in the substrate positioning section 3. Bottom receptacle fixture 3a is arranged between the conveyance ways 2 by the substrate positioning section 3. About the substrate positioning section 3, it mentions later.

[0010] The feed zone 4 of electronic parts is arranged at the both sides of the conveyance way 2, and many tape feeders 5 of a base are installed in the feed zone 4 side by side. The tape feeder 5 contains the electronic parts held at the tape, and supplies electronic parts to the pickup location by the loading head by carrying out pitch delivery of this tape. The X-axis table 6 is equipped with the loading head 7 of electronic parts. The X-axis table 6 has both ends supported by two sets of the Y-axis tables 9 installed face to face, and is constructed. Therefore, by driving the X-axis Y-axis table 6 and 9, horizontal migration of the loading head 7 is carried out, and by each pickup head 8, it takes up electronic parts from the pickup location of the tape feeder 5, and mounts them in the substrate on the substrate positioning section 3.

[0011] The camera 10 which recognizes electronic parts is arranged between the feed zone 4 of a near side, and the conveyance way 2. A camera 10 picturizes the electronic parts in the condition of having been held at the loading head 7, from a lower part. The pin stocker 11 and the nozzle stocker 12 are arranged in the side of a camera 10. Hereafter, the substrate positioning section 3, the pin stocker 11, and the nozzle stocker 12 are explained.

[0012] Drawing 2 shows the cross section of the conveyance way 2 in the substrate positioning section 3 and the pin stocker 11, and the nozzle stocker 12. Between the rails of the conveyance way 2, bottom receptacle fixture 3a is arranged free [vertical movement] in the upper part of base member 3b. Many pin holes 14 are formed in the top face of bottom receptacle fixture 3a, and the pin hole 14 is equipped with the bottom receptacle pin 13 (it is only hereafter called "a pin 13" for short) of a substrate. A pin 13 is used when aimed at the double-sided mounting substrate with which electronic parts are mounted in front flesh-side both sides.

[0013] That is, when an existing component side [finishing / electronic-parts mounting] turns into an inferior surface of tongue, like the usual substrate, an existing component side cannot be received the bottom and cannot be made superficial. For this reason, mounted electronic parts and the bottom receptacle possible part in which it does not interfere are selected among the inferior surfaces of tongue of a substrate, and it is necessary to receive in punctiform the bottom and to make it it by the pin 13. Since the bottom receptacle possible part generally changes with substrate classes, arrangement of a pin is changed whenever the candidate for mounting replaces. This arrangement change is made by selecting the pin hole 14 corresponding to a bottom receptacle [of an object substrate] possible part from the pin holes 14 prepared in bottom receptacle fixture 3a in the shape of a grid, and equipping these pin holes 14 with a pin 13. [many]

[0014] The pin stocker 11 is arranged in the outside of the conveyance way 2. Much pin receipt hole 11a is prepared in the pin stocker 11, and a pin 13 is contained by pin receipt hole 11a with a vertical posture.

[0015] The pin stocker 11 is adjoined and the nozzle stocker 12 is arranged. Much tool receipt hole 12a is

prepared in the nozzle stocker 12, and the adsorption nozzle 15 corresponding to each electronic-parts class is contained by tool receipt hole 12a. Whenever the class of electronic parts is switched, the loading head 7 is accessed at the nozzle stocker 12, and the adsorption nozzle 15 is exchanged automatically. Moreover, to the nozzle stocker 12, the clamp tool 16 of the dedication for clamping a bottom receptacle pin is also collectively contained in addition to usual adsorption nozzle 15. Drawing 2 shows the loading head 7 equipped with the clamp tool 16.

[0016] When arrangement modification of a pin 13 is needed at the time of the change of a substrate form, the loading head 7 accesses the nozzle stocker 12, and performs a tool change. That is, the adsorption nozzle 15 with which it has equipped is returned to the nozzle stocker 12, and the loading head 7 is equipped with the clamp tool 16 for pink lamps. Thereby, the desorption activity to bottom receptacle fixture of pin 13 3a can be made to do automatically through a help using the loading head 7 for electronic-parts mounting.

[0017] The air nozzle 17 is arranged in the side of bottom receptacle fixture 3a. An air nozzle 17 turns the nozzle for air jet to the bottom receptacle fixture 3a side, and prepares it in the side face of the tube part material arranged horizontally. The height location of an air nozzle 17 serves as adjustable with the vertical-movement means which is not illustrated, and the injection height injected from an air nozzle can be adjusted. That is, by adjustment of injection height, the air blow of the inside of the clearance between base member 3b and bottom receptacle fixture 3a can be carried out, and the air blow of the top face of bottom receptacle fixture 3a can also be carried out.

[0018] After foreign matters, such as electronic parts which fell at the time of mounting in the top face of bottom receptacle fixture 3a or the clearance between base member 3b and bottom receptacle fixture 3a, have remained, a residual foreign matter is blown away and removed by air by carrying out an air blow by the air nozzle 17. Moreover, the box-like container 18 for recycling which contains and collects the foreign matters blown away by the air blow is formed in the opposite side of the air nozzle 17 of bottom receptacle fixture 3a. an air nozzle 17 -- the upper part of bottom receptacle fixture 3a -- and -- or an air injection means to inject air in the lower part -- it is -- an air nozzle 17 and the container 18 for recycling -- the upper part of bottom receptacle fixture 3a -- and -- or it is a tailing means to remove the foreign matter which remains in the lower part.

[0019] This electronic-parts mounting equipment is constituted as mentioned above, and explains actuation below. In drawing 3, on the conveyance way 2, the substrate [finishing / mounting of electronic parts P] 19 is positioned by the inferior surface of tongue, and by two or more pins 13 with which bottom receptacle fixture 3a was equipped, a substrate 19 wins popularity the bottom and is carried out. Electronic parts P are newly mounted by the transfer head 7 which equipped the top face of this substrate 19 with the adsorption nozzle 15.

[0020] In the process which continues this mounting actuation, when a mounting mistake arises according to the cause of poor adsorption, the electronic parts which were omitted from the adsorption nozzle 15 as shown in drawing 4 may fall on bottom receptacle fixture of lower part of substrate 19 3a. Although a certain thing stops at a bottom receptacle fixture 3a top face among these electronic parts, in being the minute components Ps with small size, it falls to the lower part of bottom receptacle fixture 3a through the pin hole 14. Such fall components that entered in the clearance since the inferior surface of tongue of bottom receptacle fixture 3a was narrow may be hard to be discharged, the clearance between base member 3b may deposit with the passage of time, and it may become the cause of faults, such as abnormalities in rise-and-fall actuation of bottom receptacle fixture 3a.

[0021] Then, air is made to inject from the air nozzle 17 arranged in the side to the interior of the clearance between base member 3b and bottom receptacle fixture 3a as opposed to the top face of bottom receptacle fixture 3a, as shown in drawing 5. Foreign matters, such as the minute components Ps which remain in these locations and are in a deposition condition by this, are blown away by the air blow, in the container 18 for recycling arranged in the opposite side, fall and are collected.

[0022] Thereby, in the narrow part of the bottom receptacle fixture circumference of the substrate positioning section which removal by the help cannot perform easily, it is not necessary to do the foreign matter recovery activity by the help who requires time and effort. Moreover, faults, such as abnormalities of operation by a foreign matter accumulating on the narrow part which is hard to discover, can be prevented.

[0023]

[Effect of the Invention] the upper part of the bottom receptacle section which according to this invention receives a substrate the bottom and carries out it by the bottom receptacle pin at the time of electronic-parts mounting -- and -- or since it had a tailing means to remove the foreign matter which remains in the lower part, it is not necessary to do a manual tailing activity, and the fault by the foreign matter can be prevented.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The perspective view of the electronic-parts mounting equipment of the gestalt of 1 operation of this invention

[Drawing 2] The fragmentary sectional view of the substrate positioning section of the electronic-parts mounting equipment of the gestalt of 1 operation of this invention

[Drawing 3] The fragmentary sectional view of the substrate positioning section of the electronic-parts mounting equipment of the gestalt of 1 operation of this invention

[Drawing 4] The fragmentary sectional view of the bottom receptacle fixture of the electronic-parts mounting equipment of the gestalt of 1 operation of this invention

[Drawing 5] The fragmentary sectional view of the bottom receptacle fixture of the electronic-parts mounting equipment of the gestalt of 1 operation of this invention

[Description of Notations]

3 Substrate Positioning Section

3a Bottom receptacle fixture

4 Feed Zone

7 Loading Head

14 Pin Hole

17 Air Nozzle

18 Container for Recycling

19 Substrate

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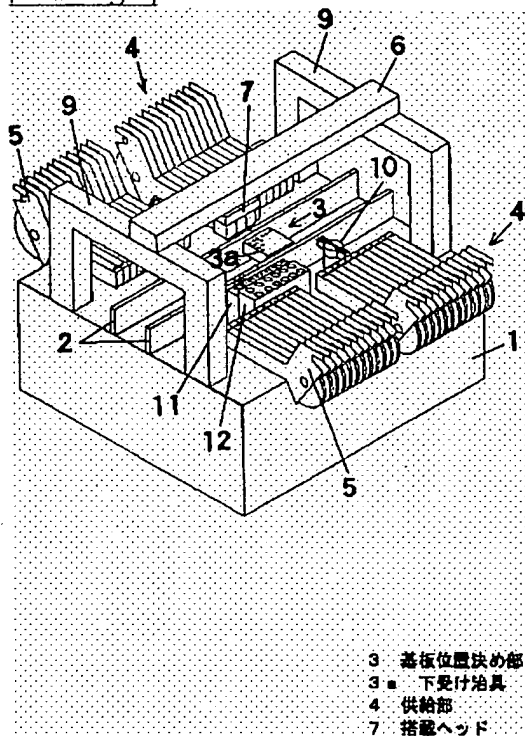
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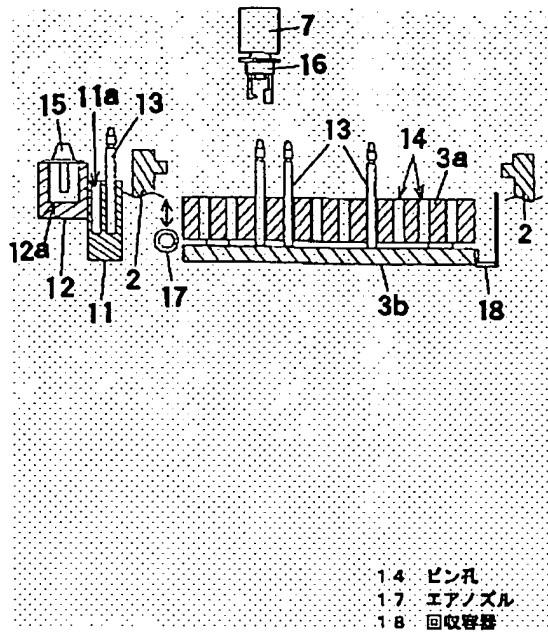
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DRAWINGS

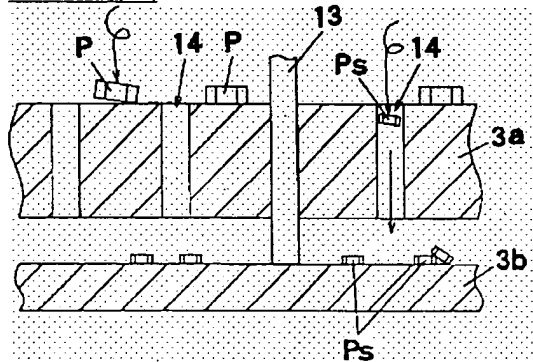
[Drawing 1]



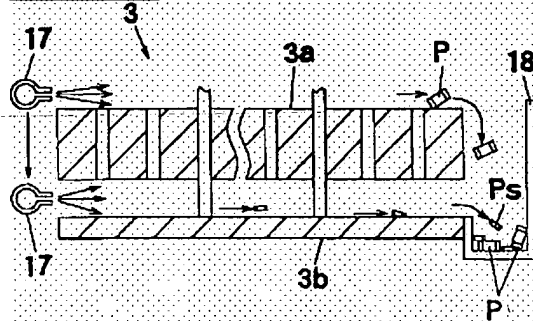
[Drawing 2]



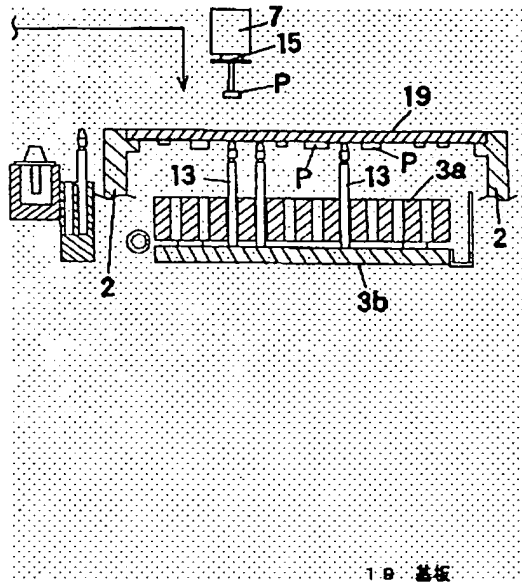
[Drawing 4]



[Drawing 5]



[Drawing 3]



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